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ABSTRACT

Performance tests are used in training evaluation to (1) certify student achievement, and (2) diagnose weaknesses in the instructional system. Proficiency measures that focus on task outcomes (product) normally provide data relevant to the first purpose, whereas measures of how the tasks are carried out (process) pertain to the second. Time or cost factors sometimes preclude the use of product measures, leaving measures of task process as the only available criteria for evaluating training outcomes. Instances in which process measures are typically substituted for product measures are described in this paper with reference to the types of tasks for which the substitution is valid and those for which it is invalid. Theoretical and practical issues pertaining to the use and misuse of process measures are discussed. (Author)

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Process Versus Product Measures in Performance Testing

William C. Osborn

Presented at the Military Testing
Association Conference
San Antonio, Texas October 1973

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PREFATORY NOTE

This paper explains why process measures are widely substituted for measures of task product and suggests ways to assess task outcome in a relevant fashion. The paper was presented at the Military Testing Association Conference, San Antonio, Texas, in October 1972.

Mr Osborn, former Senior Staff Scientist for the Human Resources Research Organization, Division No 2, Fort Knox, Kentucky, has recently been appointed Director of Division No. 2.

PROCESS VERSUS PRODUCT MEASURES IN PERFORMANCE TESTING

William J. Gibson

Consider the following situations:

After training in tank gunnery, a soldier's performance is tested on a gunnery range. During this test he will fire several main gun rounds at targets varying in size, shape, and distance. On each run his score is determined by whether he hits the target within some specified time limit. He is certified a tank gunner if he scores above some minimum level required for qualification.

Under other circumstances, a soldier with similar training may be evaluated differently. Let's assume that ammunition is scarce or that adequate range facilities are not available. When the soldier might have to be tested outside the firing conditions, he would be required to take actual or simulated measures of targets under the, a tester would assess in each case whether the gunner (a) acquired the target with smooth manipulation of the hand controller, (b) correctly ranged on the target, (c) centered the proper sight picture, (d) squeezed the firing device without losing the right picture, and (e) fired within some allotted time. Fully correct is qualified if he performed each of the five procedural steps correctly - in some minimum number of tests.

In the first situation described, a task outcome or product measure might be the basis for evaluating gunners, whereas in the second example, correct task procedure or a process measure is the basis for evaluation. Although a controversial contemporary approaches to performance testing (known as Mbo) the evaluation theories the focus of this paper.

I am chiefly interested in the use of performance tests to evaluate the results of training. Let me introduce the topic by commenting a bit the training evaluators consider to be the ideal use of product and process measures. Performance tests are used in training evaluation to serve two purposes (which criteria achievement, and (b) to diagnose weaknesses in the instructional process. In the use of such tests, proficiency measures which focus on task outcomes (products) normally provide the relevant to the first purpose, whereas measures of how the task is carried out (process) pertain to the second. For example, the number of targets hit by the soldier gunner would be the product measure by which the qualification as a tank gunner is assessed. However, if he fails to qualify we would also want to know why before new training would? This is where process measures are useful. If the gunner consistently missed targets, but it because he ranged incorrectly, or because he improper sight picture, or was not able to maintain the gun by during firing? This type of data is useful in diagnosing areas of training deficiency, and it is essential in efficiently remediating learners.

Both product and process measures are important within clinical roles used for these respective purposes in evaluating the results of training is

Product and Process as Measures of Student Achievement

With this background, I would like to focus on a few key issues of performance measures in verifying student achievement. In testing a student to determine whether he is qualified to advance to the next level of training, an

[illegible]

Types of Tasks

[illegible]

(1) Tasks in which the product is the process
(2) Tasks in which the product follows from the process
(3) Tasks in which the product coincides / differs from the process

[illegible]

[illegible]

[illegible]

[illegible] [illegible] [illegible] [

[illegible]